DODGE (J.R.)

EXTRACT FROM THE REPORT OF JOSEPH NIMMO, JR., CHIEF OF THE BUREAU OF STATISTICS, TREASURY DEPARTMENT, ON THE INTERNAL COMMERCE OF THE UNITED STATES, PUBLISHED DECEMBER 1, 1879.

PRODUCTION AND DISTRIBUTION

OF

CEREALS

OF THE

UNITED STATES.

BY

J. R. DODGE.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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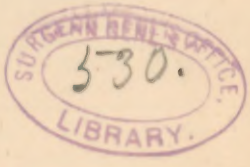

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This report on the production and distribution of the cereals of the United States was prepared by Mr. J. R. Dodge in reply to inquiries submitted to him by Mr. Joseph Nimmo, jr., Chief of the Bureau of Statistics, and appears as a part of the appendix to the Report on Internal Commerce, published December 1, 1879.

INFORMATION FURNISHED BY J. R. DODGE, ESQ., IN REGARD TO THE PRODUCTION AND DISTRIBUTION OF CEREALS IN THE UNITED STATES, IN REPLY TO INQUIRIES ADDRESSED TO HIM BY THE CHIEF OF THE BUREAU OF STATISTICS, OCTOBER 4, 1879.

PRODUCTION AND DISTRIBUTION OF CEREALS.

Question 1. Please to describe the distribution of cereal productions of the United States, with reference to home supply and to surplus exported to foreign countries, considering the subject by States and groups of States, in such manner as you may deem proper.

Answer. While the quantity of cereals moved from the States in which they are grown varies annually with the fluctuating foreign and domestic demand, it may be stated as an average of recent years that about one-fifth of the whole volume is involved in the distribution. The product having increased in ten years from 1,450 million bushels to 2,178 million bushels (as estimated for 1877), the export movement increased from 39 million bushels in 1868 to 189 million bushels in 1878. About 3 per cent. of the national supply was exported in 1868; nearly 10 per cent. in 1878. The estimates for the crop of 1878 make the still higher aggregate of 2,302,254,950 bushels, of which 246,611,507, or nearly 11 per cent., were exported. In the mean time the increasing population of sections of the United States not self-supporting enlarged domestic distribution, but not proportionally with the increase of exportation nor with the increase of production.

The yearly fluctuation in production of cereals is thus indicated:

Years.	Bushels.	Years.	Bushels.
1868	1,450,789,000	1873	1,538,892,891
1869	1,491,412,100	1874	1,454,180,200
1870	1,629,027,600	1875	2,032,235,300
1871	1,528,776,100	1876	1,962,821,600
1872	1,664,331,600	1877	2,178,934,646

The average of the above is 1,693,140,103 bushels, or 40.8 bushels per capita of the assumed average population of the period. Of this average supply corn constituted 63.1 per cent., oats 17.2, wheat 16.14, barley 1.81, rye 1.1, and buckwheat .65 per cent.

The proportion distributed of each variety of grain varies greatly. Barley, which constitutes so small a part of the cereal supply, is nearly all moved from the locality of its growth, and about one-third from the States in which it is produced. Wheat has attained a production so large that about 25 per cent. was exported in 1878, and four-tenths of the crop was moved from the States of surplus production.

Corn is necessarily consumed mainly in the neighborhood of its production, only 6.49 per cent. having been exported in 1878, and not exceeding one-eighth of the crop moved beyond the limits of producing States. The relative proportion of each crop exported, and that retained for consumption, is as follows:

Cereals.	Production.	Consumption.		Exportation.	
	Bushels.	*Bushels.*	*Per cent.*	*Bushels.*	*Per cent.*
Corn	1,342,558,000	1,255,365,890	93.51	87,192,110	6.49
Wheat	364,194,146	274,026,187	75.24	90,167,959	24.76
Oats	406,394,000	402,678,521	99.09	3,715,479	.91
Barley	34,441,400	30,519,899	88.61	3,921,501	11.39
Rye	21,170,100	16,930,859	79.98	4,239,241	20.02
Buckwheat	10,177,000	10,177,000	100.00	.....	.....
	2,178,934,646	1,189,698,356	91.32	189,236,290	8.68

This is nearly 9 per cent. of the quantity in bushels, and nearly 10 per cent. of the weight of total production. Until recently the movement of grain eastward for domestic consumption was greater than the shipments for export. In six years exportation increased from 74 millions to 189 in 1878, and in the past year, from July 1, 1878, to June 30, 1879, has advanced to the unprecedented figure of 246 millions. This does not include 15,565,190 pounds of bread and biscuit, maizena, and similar preparations to the value of $1,740,471, and other grains valued at $817,536, which would bring the real aggregate nearly up to 250 million bushels. With such a shipment of breadstuffs to foreign countries, which is arresting the attention of the civilized world and visiting a crushing competition upon the farmer of England and France, we still retain and use eight-ninths of the volume of production. If we make a comparison by values, the proportion exported is shown to be somewhat larger, by reason of a larger shipment of the more valuable kinds of grain, and also because prices are higher at ports of shipment than the average prices paid by consumers throughout the States. Giving equal prices to the proportions respectively shipped abroad and held at home for consumption, the intrinsic value of the exports would be nearly one-sixth of the whole, while the reported export value would be more than one-fifth of the aggregate farm valuation.

This calculation is on the basis of the estimates of the Statistician of the Department of Agriculture for the crop of 1878, and the exports are those of the fiscal year ended June 30, 1879, as follows:

Cereals.	Production.	Consumption.		Exportation.	
	Bushels.	*Bushels.*	*Per cent.*	*Bushels.*	*Per cent.*
Corn	1,388,218,750	1,300,333,858	93.67	87,884,892	6.33
Wheat	420,122,400	272,434,751	64.85	147,687,649	35.15
Oats	413,578,560	408,126,424	98.68	5,452,136	1.32
Barley	42,245,630	41,530,094	98.31	715,536	1.69
Rye	25,842,790	20,971,496	81.23	4,871,294	18.77
Buckwheat	12,246,820	12,246,820	.....	.....	.....
	2,302,254,950	2,055,643,443	89.31	246,611,507	10.71

Maize.—The distribution of maize, its local production relative to population and farm animals to be fed, are essential points to be presented. The following table gives the number of cattle, of swine, and of bushels of corn produced in 1877, to each 100 of the estimated population (in 1878) of the several groups of States named:

Groups of States.	Corn crop of 1877.	Quantity, per 100 of population.	Cattle, per 100 of population.	Swine, per 100 of population.	Assumed population.	Increase per cent. of population.
New England	*Bush.*	*Bush.*	*No.*	*No.*		
Middle States	9,700,000	241	36	8	4,011,112	15
Southern States	77,570,000	755	38	20	10,276,194	15
Kentucky and Tennessee	229,460,000	1,978	82	86	11,596,003	21
Central Western States	110,000,000	3,553	45	124	3,095,437	20
Lake States	849,400,000	6,350	87	116	13,375,043	30
Pacific States	62,650,000	1,827	66	40	3,428,396	28
	3,778,000	250	192	50	1,507,036	50
	1,342,558,000	2,839	64	68	47,289,221	22.6

Here are about 28 bushels, or, excluding the exports, fully 26 bushels to each inhabitant, and only nine States lying in the heart of the West to exceed this average; all others, in fact, fall far short of it. Indeed, nearly all of the available surplus is found in a single group of States, the river States of the West—Ohio, Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.

Though maize is grown in every State and Territory of the United States, and constitutes five-eighths of the volume of cereal production, less than a fourth of the number have a corn supply exceeding their requirements. A small surplus is produced in Kentucky and Tennessee. The Lake States, Michigan, Wisconsin, and Minnesota,

have barely enough for home consumption, which is less per capita by a fourth than the average of the United States. Their comparative deficiency in corn is best seen in the numbers of swine, 40 to 108 in the corn belt. Their cattle, though becoming numerous, are in large proportion young or grazing stock, or milch cows, with comparatively few corn-feeders. The immense preponderance of corn-growing in the seven central States of the Great Valley is seen in the product of 62 bushels per capita in States less exclusively agricultural than those of any other group in the West or South, having an average of about two million people, many of whom are employed in manufacturing industries. A group of States with less than a third of the population of the country produces five-eighths of the corn supply of the United States.

The progress of this group in corn-culture during 38 years is thus exhibited:

States.	1849.	1859.	1869.	1877.
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*
Ohio	59, 078, 695	73, 543, 190	67, 501, 144	97, 000, 000
Indiana	52, 964, 363	71, 588, 919	51, 094, 538	96, 000, 000
Illinois	57, 646, 984	115, 174, 777	129, 921, 395	260, 000, 000
Iowa	8, 656, 799	42, 410, 686	68, 935, 065	156, 000, 000
Missouri	36, 214, 537	72, 892, 157	66, 034, 075	103, 000, 000
Kansas	.....	6, 150, 727	17, 025, 525	98, 000, 000
Nebraska	.....	1, 482, 080	4, 736, 710	38, 000, 000
	214, 561, 378	383, 242, 536	405, 248, 452	848, 000, 000

The *rate* of progress is liable to be misunderstood in a casual reading of these figures. The crop of 1869 was called a "failure"; its acreage was sufficient for a crop of 500,000,000 bushels in a good season. Allowing an increase of population in these States of 30 per cent. in eight years (the increment is far greater in Kansas and Nebraska) the product per capita would be increased to 63 bushels. In comparison with the thirty-one other States of the country this group of seven makes a showing as follows:

Groups of States.	Product of 1859.		Product of 1877.	
	Bushels.	*Per capita.*	*Bushels.*	*Per capita.*
Group of seven States	383, 242, 536	52	848, 000, 000	63
Other States and Territories	445, 550, 206	19	494, 558, 000	15

Were the requirements of consumption in exact proportion to population there would have been a surplus of 35 bushels in these States, and a deficiency of 13 in all others. This surplus of seven States would be nearly equivalent to the production of thirty-one States.

The question often asked, What is the necessary consumption of maize per capita? can only be answered by saying that no fixed quantity is a necessity for all States alike or even for a single locality. It depends not only upon the demand for pork and beef and spirits, but also upon the comparative quantity and cheapness of hay and other forage with which corn comes into competition. If the product falls as low as 800,000,000 bushels in a cold and wet season, the causes which produce comparative failure act to swell the product of hay. The always abundant supply of corn stover is better utilized. There is still a sufficiency of feeding material, so that the most obvious result of the scarcity is a higher price for corn and probably a slight increase in the cost of meat and other animal products. If 1,300,000,000 bushels are produced corn is very cheap. There is actual waste of coarser feed. Wild hay in the West is less extensively cured. Prices of meat, especially of pork products, are somewhat cheapened, and such cheapness often results in increased demand. So the corn currency is both interconvertible and elastic.

Another inquiry is frequently made, What is the necessity for 40 bushels of cereals per capita in the United States when only 17 are required in Europe? It is easily answered. Grain is not only the food of man but the feed of animals, and in Europe grasses and forage crops occupy a larger place in feeding economy than in this country. Great Britain excels every other country in high feeding and rapid fattening of cattle, yet produces scarcely three-fourths the average European supply of animals, and her imports are only used for human food (and beverages), and corn mainly for feed of horses in cities. In that country mangels, turnips, and forage plants take the place occupied by maize in this country and in some districts of Southern Europe. The refuse of

the beet in sugar-making, in Central Europe, also furnishes a valuable substitute for the cereals in feeding farm animals.

With the present foreign demand for animal products, and under the prevailing system of rural economy in the United States, there is a reasonable requirement of 25 bushels of corn per capita, or 50 per cent. more than the average need of Europe at present, yet a reduction to 22 bushels would ordinarily cause no serious inconvenience.

The wheat surplus.—The wheat surplus is produced entirely in that portion of the country north and west of the Ohio River, in the central area lying between that river and the lakes and the Alleghany and Rocky Mountain ranges, and in a smaller area on the Pacific Coast. Lying between are broad areas of mountain, valley, and high plateau ready for the plow, and other tracts available for cultivation with the aid of irrigation, which will become the wheat-fields of the future.

The portion of the country requiring a part of this surplus comprises New England, the Middle States, and the cotton States. New England produces nearly three-tenths of a bushel for each inhabitant; the Middle States grow about half the quantity necessary for a full supply, or 3⅛ bushels; the Southern Atlantic and Gulf States almost as much; and Kentucky and Tennessee are self-supporting with nearly 6 bushels. All the remaining States, except Nevada and Colorado, yield a surplus. This surplus, for consumption in 1878, was 11¼ bushels per capita in the corn-growing belt between Ohio and Kansas, 22½ bushels in the Lake belt, and 23 in the Pacific States and Territories, but fully 25 bushels in a year of large production in California.

While but seven States afford an appreciable surplus of corn, there are twelve that aid in supplying the wheat demand of the other States and of foreign countries. What is the home demand? With increase of population and of area seeded the yearly increase in requirement for home consumption is at least 6,000,000 bushels. Reckoning the population in 1878 at 47,289,221, at different rates of increase for the several sections, ranging from 15 per cent. in New England to 50 in the Rocky Mountain and Pacific region, the estimated demand is—

	Bushels.
For bread	223,302,383
For seed	40,913,308
Total	264,215,691

Compare this quantity with the crop of 1877, minus the exportation of the fiscal year commencing July 1, 1877, and ending June 30, 1878, with the following result:

	Bushels.
Estimated crop of 1877	364,194,146
Exports of wheat and flour	90,167,959
Leaving a difference of	274,026,187

This is 9,810,496 bushels more than the sum of the estimated quantities needed for seed and bread. After allowing further for wheat fed to farm animals, mainly in California, but to a limited extent elsewhere in sections of abundant production, and a small amount lost by fire or casualties of transportation, we may fairly assume that this excess has been nearly exhausted.

The requirement of wheat per capita is not the same in all sections. In the South there is a large proportion of corn used, by whites as well as negroes. There are localities in the cotton States where half the average rate of consumption of wheat for the whole country is not sustained. In Maryland and Virginia the proportion used is much larger than in Alabama or Mississippi. Taking the twelve States from Maryland to Texas together, while some use less than four bushels and others nearly five, four bushels may be deemed a full average. For Tennessee and Kentucky a barrel of flour per capita, or 4½ bushels, is assumed; and for the East, where little corn is used, and for the West, where wheat is so abundant and cheap, 5 bushels per head. We find in support of these reasonable assumptions that the facts of local and general production, as well as those of distribution, as found in the records of trade and transportation, point to substantially the same results. On the basis of the crop of 1877

the consumption, deficiency, or surplus of the several groups of States may thus be stated:

	Production.	Consumption.		Surplus.	Deficiency.
		For bread.	For seed.		
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*
New England	1,174,800	20,055,560	104,800	.....	18,985,560
Middle States	34,180,000	51,380,970	3,514,083	.....	20,715,053
South Atlantic and Gulf	37,250,000	46,384,012	6,814,150	.....	15,948,162
Kentucky and Tennessee	18,550,000	13,929,466	2,893,714	1,726,820	.....
Western Central	161,450,000	66,875,215	16,360,060	78,214,725	.....
Lake States	77,214,346	17,141,980	6,778,260	53,294,106	.....
Pacific and Territories	34,375,000	7,535,180	4,447,641	22,392,179	.....
	364,194,146	223,302,383	40,913,308	155,627,830	55,649,375

NOTE.—The States comprising these several groups are as follows:
1. New England States—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut.
2. Middle States—New York, New Jersey, Pennsylvania, Delaware.
3. South Atlantic and Gulf—Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas.
4. Kentucky, Tennessee.
5. Western Central—Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, Nebraska.
6. Lake States—Michigan, Wisconsin, Minnesota.
7. Pacific States and Territories—Colorado, Nevada, California, Oregon, Territories.

The first three groups, comprising twenty-two States, on or near the Atlantic and Gulf coasts, with more than half of the population of the country, produce scarcely one-fifth of the crop, or 71,604,800 bushels, and require from other States 55,649,375 bushels. On the other hand, two groups, including ten States, west and north of the Ohio River, with an assumed population of about 17,000,000, or two-thirds of the number in the above-mentioned twenty-two, produce a surplus of 131,508,831 bushels.

On the basis of the above figures the distribution of the crop of 1877 would be as follows:

	Bushels.
Estimated crop of 1877	364,194,146
Used for bread	223,302,383
Used for seed	40,913,308
Surplus and loss	9,810,496
Exported	90,167,959
Total distribution	364,194,146

The seed is estimated at the rate of 1½ bushels per acre, in accordance with the result of a statistical investigation relative to modes of seeding and quantity used throughout the country. As few would assent to a larger estimate of production in 1877, and as the facts of local consumption seem to forbid inexorably an assumption of a smaller quantity, it is evident that these figures of production are substantially correct. Yet it cannot be assumed that the exact amounts indicated by sections are invariably required.

Differences in prices, the result of abundance or scarcity, may slightly affect consumption of different years in any one section. With a small crop and high prices there will be some diminution of consumption, especially in localities where corn bread is largely used and wheat is not deemed an absolute necessity. In cities and towns of the populous seaboard States consumption is very little restricted by increased cost, as wheat bread is there a necessity that cannot well be economized.

Since the calculation above was made for the crop of 1877, the estimates of the Department of Agriculture for 1878 have been completed. Applying the same ratios of local consumption and of seeding and adding the exports, we have the following distribution for 1878–'79:

	Bushels.
Used for bread (2½ per cent. increased population)	228,877,978
Used for seed	48,162,840
Exported	147,687,649
Total distribution	424,728,467

This is 4,606,067 more than the estimated production, a difference less than half of the surplus in the calculation of the previous year. The export year does not quite

coincide with the crop year; the local ratios of consumption are not assumed to be infallibly correct, nor can they be inexorably uniform from year to year under all circumstances of price and ability to purchase; yet, in view of these multifarious causes of discrepancy and the added uncertainty of the accuracy of these estimates, the test could not be more satisfactory, nor the results more in harmony with all the ascertainable data of production and distribution.

WESTERN MOVEMENT OF THE CENTER OF PRODUCTION.

Question 2. Please to describe the western movement of the center of cereal production, stating the rate of movement of the centers of production of wheat and corn, respectively.

Answer. The products of wheat and corn at different periods, and the longitudinal lines dividing equally the volume of such production, are thus expressed:

Years.	Wheat.	Degrees of longitude.	Corn.	Degrees of longitude.
	Bushels.	° ′	*Bushels.*	° ′
1849	100, 485, 944	81	592, 071, 104	85
1859	173, 104, 924	85 24	838, 792, 742	86 30
1869	287, 745, 626	88	760, 944, 549	88
1877	365, 094, 800	89 6	1, 342, 558, 000	89 6

The production is that returned by the census, except that for 1877, which is from the statistical returns of the Department of Agriculture.

The westward movement of the central line of wheat production in twenty-eight years measured 8° 6′. Calculating the distance traversed westward on the line of the fortieth parallel (which also nearly equally divides the crop north and south) at the rate of 280,135 feet to each degree, the movement was equal to 430 miles, or 15.3 miles per annum. The movement of the line dividing equally corn production, commencing in 1849 4° or 212 miles farther west, and reaching the same line of longitude as wheat in 1877, had a velocity only a fraction more than half as great as that of wheat. The rate was 7.78 miles per annum, and the distance traversed 218 miles.

The line for wheat changed from Eastern Ohio in 1849 to Eastern Indiana in 1859, Eastern Illinois in 1869, and Central Illinois in 1877. That for corn was nearly twenty years in moving across the State of Indiana.

The progress of the wheat center was greater in ten years than in the subsequent eighteen. This inequality of rate of movement, so noticeable as to wheat, is not shared by corn, which was 1° 30′ for each of the two decades, and 1° 6′ for the past eight years.

The tendency of wheat production to move westward is still active, and may move onward for many years at a reduced rate of movement per annum, as wheat culture subdues the high plateaus and mountain valleys between the Missouri and the Pacific coast. On the other hand, the western progress of corn production must henceforth be very slow, being effectually barred by the elevation reached near the western border of Nebraska and Kansas, which makes corn culture either precarious or impossible throughout nearly the entire area westward to the Pacific Ocean; and its center must therefore remain near the Mississippi River.

RATE OF YIELD AS AFFECTED BY MODES OF CULTURE.

Question 3. Please to describe the local changes in the rate of yield of wheat and corn respectively, as affected by the skill and intelligence with which the culture of these products is carried on, and with especial reference to the effect of fertilizers and soil depletion.

Answer. The prevailing practice in this country, as in the settlement of all new countries where lands are productive and cheap, has been exceedingly careless and exhaustive, especially in the production of cereals. A superficial system, which gives for a few years the largest production at the smallest cost for labor, is almost invariably adopted. A gradual decline in yield soon follows, partly from soil exhaustion and in part from smothering by weeds, and from the inability of plants of impaired vitality to withstand the attacks of insects. This has been the case, as respects wheat, in Western New York, in Iowa, California, and other noted wheat districts, though its real progress is masked by the fact of constant additions of fresh lands to the breadth in cultivation.

In the course of time this irrational system is gradually abandoned, from necessity, when it yields no profit, and is succeeded by an expensive course of improvement, with employment of fertilizers and the application of skill and science. The general

prevalence of careless culture is seen in the average national yield for a series of years, which is about 12 bushels per acre. The opposite extreme of highest and most scientific culture is seen in Great Britain, where for thirty years the average yield has been about 28 bushels. The European states occupy all points between these extremes, according to degree of advancement in rural practice. Hungary, with a richer soil naturally than England, has the same wheat average as the United States.

But the different States of this country illustrate as wide a range of yield as those of Europe; and, as a rule, those having the richest lands have a low rather than high rate of yield. Large yields are obtained by fertilization and thorough culture rather than by natural fertility. The following statement of the average yield, for the past five years, of States representing different sections of the country, will illustrate this:

Year.	New Hampshire.		New York.		Maryland.		Georgia.		Michigan.		Iowa.	
	Corn.	Wheat.	Corn.	Wheat.	Corn.	Wheat.	Corn.	Wheat.	Corn.	Wheat.	Corn.	Wheat.
1873	[illegible]	[illegible]	[illegible]	13.5	21.4	11.3	12.3	7	31	12.2	29	13
1874	36.4	16	[illegible]	15.6	20.5	10.7	11.1	7.3	27	14.2	29.2	11.6
1875	[illegible]	17	34	[illegible]	30	11	10	7.5	[illegible]	13.5	[illegible]	9.7
1876	[illegible]	15	[illegible]	15	[illegible]	12.5	11	6	29	12	30	6.1
1877	[illegible]	17	[illegible]	18	[illegible]	13.8	10.5	9.5	31	17.5	32.5	14.5
Average	39.7	16	31.3	14	25.7	11.6	10.9	7.4	30.3	13.9	31.3	10.9

The rate of production stands highest in New England, because the only possibility of profit comes from fertilization and careful cultivation. The available supply of fertilizers limits such cultivation to very small areas. New York and Michigan have about the same average for wheat, and the difference is slight in the yield of corn. The new corn lands of Iowa surpass those of Maryland in productiveness, but the general and comparatively liberal use of fertilizers for wheat in Maryland more than counterbalances the superiority of soil in Iowa. The low rate of yield in Georgia is representative of the impaired production of most of the cotton States from the predominance of the culture of the favorite crop and the comparative neglect of all others.

A single example of deterioration in yield illustrates the uniform result of the practice in vogue in primitive wheat-growing. The average yield in California for five years prior to 1860, according to the reports of the agricultural society of that State, was 20 bushels; for the last ten years the average has been but 14 bushels. The assessors' returns of that State from 1868 to 1876, inclusive, made 13.93 bushels; the estimates of the Department of Agriculture for the same period, 13.66 bushels. The year 1877 made the average still lower. Poor crops in Minnesota are more frequent than formerly, and the tendency is to lower averages. Taking the years of low yield in order, 1867 gave 11.01 bushels, 1871 made a lower yield of 12.28, and 1876 resulted in the still lower level of 9.61 bushels.

DIFFERENCES OF PRICE IN HOME MARKETS.

Question 4. Please to describe the differences in the home market price of wheat and of corn in different localities as affected by the cost of transportation and by other causes?

Answer. The average farm prices of wheat and corn in December of 1877 and 1878, respectively, in a few States, representing sections in which similar conditions affecting prices may be presumed to exist, are thus presented:

State.	Wheat.		Corn.	
	1877.	1878.	1877.	1878.
New Hampshire	[illegible]	$1 48	[illegible]	[illegible] 61
New York	1 22	1 [illegible]	[illegible]	50
Maryland	1 [illegible]	98	53	45
Georgia	1 36	1 18	[illegible]	60
Texas	1 21	[illegible]	[illegible]	44
Tennessee	1 04	84	40	41
Ohio	1 24	[illegible]	[illegible]	33
Illinois	1 04	75	[illegible]	25
Minnesota	91	[illegible]	[illegible]	29
Missouri	1 [illegible]	67	27	26
California	1 [illegible]	1 [illegible]	[illegible]	60

The average farm value of wheat for the whole country was $1.08 in 1877 and 78 cents in 1878; of corn, 35.8 cents and 31.8 cents respectively. The export price of wheat was $1.34 in the fiscal year 1878, and of corn 56.2 cents—the produce of the year 1877.

The statement above shows that the prices of wheat and corn in New England were uniformly above the export price, because the cost of transportation from the West to inland towns averages higher than to the seaboard cities, and also because the home produce, especially of corn, is held at a higher valuation than the eastern grain that competes with it.

In the Southern States prices are often higher than at the ports of exportation—always when an insufficient home supply, rendering necessary receipts from the West, concurs with freight rates higher than those to the seaports to swell local values. In recent years large areas of the South which are self-supporting have reported prices lower than those of exportation. The fluctuations from year to year, and the differences in average prices of States in the same year, are very great in the cotton States, owing to comparative local abundance or deficiency in production. For instance, the price of wheat in Texas, in December of 1877, was $1.21, and but 86 cents in 1878, the acreage having increased and the yield advanced from 12 to 16 bushels. The prices of corn, on the contrary, slightly advanced from 43 to 44 cents, not because the yield was less, but on account of the great demand, caused by heavy immigration, for a grain of which nearly ten times as much as of wheat is used. Then there are still greater differences in price in the several counties of a State, owing to want of railroad transportation. If there should be a local surplus, the price will be low, and if a deficiency, which may not be enough in quantity to induce competition to supply it, the price will advance in proportion to the necessities of the demand.

INFLUENCE OF FOREIGN DEMAND ON PRICE.

Question 5. Please to describe the effect of foreign demand upon the price of wheat and corn in this country.

Answer. The price of grain, as of anything else, is controlled by the demand, and any augmentation of existing demand, whether from domestic or foreign needs, tends to advance its price. The idea that the price paid for corn exported controls the domestic price, or affects the rate of value of the nineteen-twentieths of the crop that is used at home, any further than would an increased home demand for the other twentieth, is absurd. If it is wanted abroad at a valuation prevailing here, it is exported to meet such demand; and instead of forty or eighty million bushels, two hundred could be sent in any year of moderate abundance, with no other effect than an increase of price in proportion to enlarged demand. The range of differences in production of different years is five times the quantity of the largest exportation ever made. So it is not the foreign demand that accounts for high price in corn, but a poor crop. In illustration, the export of 1874–'75 was about 30,000,000 bushels, and the average farm value of the crop of 1874, 64.7 cents per bushel; the export of 1877–'78 was about 87,000,000 and the average price 35.8 cents. An exportation three times as large as that of 1874 certainly did not depress the price 45 per cent., but it is very plain that a product 57 per cent. larger did produce the heavy decline. Political economists may tell us in vain that the foreign value of an exported article fixes its price for home consumption, when common sense suggests that 500,000,000 bushels of increased production is far more potent to depress than a foreign demand for 90,000,000 can be to raise the price. In truth, comparatively large as our corn exports have become, they are of minor influence in affecting the value of the crop. The exports of meat, butter, cheese, wool, and spirits have a decidedly stronger influence. Placing side by side the production and export with the average home value, it will be seen how insignificant a cause of disturbance in corn values is the foreign trade:

Years.	Export.	Home value.	Product.
	Bushels.	*Cents.*	*Bushels.*
1872–'73	40, 154, 374	38. 9	1, 092, 719, 000
1873–'74	35, 985, 834	48.	992, 274, 000
1874–'75	30, 025, 036	64. 7	850, 148, 000
1875–'76	50, 910, 532	42.	1, 321, 069, 000
1876–'77	72, 652, 611	37.	1, 283, 827, 500
1877–'78	87, 192, 110	35. 8	1, 342, 558, 000

Careful examination of this table will show very clearly that the price depends upon quantity grown. A reduction of 10 per cent. in quantity in 1873 from a medium crop only, raised the price from 38.9 to 48 cents, and a still worse "failure" in the following

year had a cumulative effect in advancing the price to 64.7 cents. Since 1874 there has been a succession of large crops, attended necessarily by a constant reduction in price. But we cannot expect an exact ratio between the product and the price in different years, because there are minor causes which have some influence. Among these there has been a potent cause of reduction of price in the general shrinkage of all values during this period. On the other hand, several causes have tended to counteract the decline: among them, 1st, the rapid increase of population stimulating the demand; 2d, the export of live cattle for slaughter, and the growth of the fresh meat and preserved meat trade; and, 3d, the increased exportation of corn. It is seen that while the exports increased from 30 to 87 million bushels, the price declined from 64.7 to 35.8 cents, which does not prove that exportation has no influence in advancing price, but that its power is too feeble to cope with an increased production of 492 million bushels.

It is neither probable that exportation of corn will be greatly increased, nor is such increase desirable, as there is usually more profit in the sale of meat and other products of corn. The loss of soil fertility by such export, and the cost of transportation, which is often far greater than the original value of the grain, will ultimately bring both farmer and farm to poverty, if the policy of selling corn is long persisted in. On the contrary, the production of meat and wood will enrich the soil and furnish products for transportation worth $100 and $300 per ton, respectively, instead of $10. At present, in addition to the legitimate cost of transporting these cheap and bulky products, they must bear a large proportion of the cost of western bound goods of high value in proportion to weight, because this policy *requires the return empty of three of every four of the cars moved eastward.*

The influence of foreign demand upon prices is far more potent and commanding in the case of wheat. It involves a much larger proportion of the crop, reaching last year 24.76 per cent. of its volume. The proportion is so large, and the range of its fluctuation so wide, that serious disturbance in the markets often results. It not unfrequently occurs that a moderate yield is accompanied by low prices, and a large crop is marketed at high rates. There is no doubt that the wheat farmer is at the mercy of the foreign demand. If British wheat fields are blighted, there is rejoicing on our prairies over remunerative harvests. If the garners of continental Europe are full and England's wants are at a minimum, there is dissatisfaction in the West, liable to be vented on the currency, the tariff, or the railroads.

While corn is mainly used for feeding and fattening animals, wheat is almost exclusively appropriated as bread for man. While a short crop of the coarser grain may be supplemented by the substitution of hay, stover, and roots, and a very large one may be used more lavishly in competition with other feeding material, wheat must wait almost exclusively on the requirement of man for bread supply, and be subject to greater fluctuation in value as an inevitable result of this limitation of use. It is also subject to greater fluctuations in rate of yield than corn and other crops from the vicissitudes of the seasons and the depredations of insects. The quantity required annually for exportation is still more variable than the amount of the crop; the heaviest foreign demand may occur in a season of low production, and the lightest in a year of abundance, increasing the range of fluctuation. The conditions of a successful yield are so different, however, as between winter and spring wheat, that a failure of the one is often offset by a large yield of the other, so that the measure of local injury and loss is never fully apparent in the average yield of the whole country, and the same cause, of course, limits the range of fluctuation in prices.

Yet this range is quite too wide for the satisfaction of the wheat-grower, who is at one time elated with remunerative prices, and at another depressed by rates that fail to pay the cost of production. In 1868 the average export price was $1.91 per bushel; in 1878, $1.12. The crop of 1873 was much larger than the three preceding, yet the heavy foreign demand advanced the export price beyond that of any previous crop, with one exception, back to 1868. The exportation of that year was 91,000,000 bushels, never again equaled until 1878, and yet the export price was $1.42. Again, in 1878–'79, the world was astonished that the United States could make good the unprecedented deficiency of France, after responding to the requirements of a British crop failure, without increasing the price of wheat. With such a crop as in 1878, but for European deficiencies, prices would have proved "ruinous" to wheat-growers.

FORM OF FUTURE CORN EXPORTATION.

Question 6. Please to state your views as to the probable disposition of future corn crops, with especial reference to the magnitude of the exportation of corn, whether in the form of grain or of some of its products.

Answer. Exportation will increase in absolute quantity, probably in the form of raw grain, certainly in the many products of maize. It is not to be anticipated that the quantity in proportion to population will continue to increase, unless for a very brief period. The rapid increase of population will enlarge immensely the home de-

mand, and immigration will tend in a slight degree to relieve the pressure of foreign want without diminishing foreign consumption, the surplus population only being withdrawn, leaving higher wages and ampler means for procuring food supplies.

The supply of maize has kept pace for thirty years with increase of population, though the number of workers in agriculture is proportionally less as the industries of manufacturing, mining, and transportation have been developed. Agricultural implements have enlarged the productive power of the rural laborer; he has been relieved in part from the drudgery of his occupation, and allowed time for the exercise of more intelligent labor in soil improvement, without any reduction of the former plethoric production of maize, the first of American field crops. The difference in production and exportation of the years 1868 and 1878 indicates a rapid growth of this interest in the past ten years

	1868.	1878.
Crop, bushels	768,320,000	1,342,558,000
Exportation of domestic grain (corn), bushels	11,147,490	85,461,098
Exportation, bacon and hams, pounds	43,659,064	592,814,351
Exportation, pork, pounds	28,690,133	71,889,255
Exportation, lard, pounds	64,555,462	342,667,920

In this period, great as is the advance in exportation, corn in grain has held an even race with its products, increasing 666 per cent., while the increase in pork products has been 635 per cent. The recent impulse to foreign trade in fat beeves, and the great growth of the fresh meat trade which had its origin three years ago, tend to enlarge corn exportation in the form of secondary products. Maize has never yet made much progress in displacing wheat and rye as a bread grain among European peoples whose preferences have been fixed by the habits of hundreds of years, and the prospect is not favorable for the early accomplishment of so radical a change. As a substitute for oats or other horse feed, it is gradually gaining favor by its cheapness, and in those (few) countries which import horse feed to any appreciable extent, its use will increase if prices continue comparatively low. There is another bar to rapid extension of this trade, the ruinous proportion of transportation in the element of ultimate cost. Kansas, Nebraska, Iowa, and Illinois furnish corn for shipment to Liverpool from Chicago. The average value of the crop of 1877, for those States, was 25 cents per bushel on the farm, and the cost of shipment from Chicago averaged 27 cents, at rates low without precedent up to that date. With the freight added from the farm to Chicago, the transportation from the farm to Liverpool would be about 150 per cent. of the original value, and the commissions and profits another 50 per cent. So we are not surprised to find the average value of Chicago No. 2 corn in Liverpool 77 cents per bushel, three times the home value. The cost of carriage is too great to warrant the expectation of great extension of this trade. In the summer of the present year, however, rates from Chicago to Liverpool were at one time as low as 16 cents per bushel.

On the contrary, the economies of transportation, the increasing use of meats in foreign countries, and the opportunity for ingenuity in catering to the tastes of foreign consumers in the preparation of food products, lead to the belief that the trade in these condensed forms of maize is as yet in its infancy, and destined to great expansion in the future.

THE CAPACITY OF THIS COUNTRY FOR CORN CULTURE.

Question 7. Please to state your views as to the capacity of this country to extended corn production.

Answer. The present area in corn is probably a little in excess of 50,000,000 acres; present area in farms near 450,000,000 acres; total area of States, 1,275,000,000, including Territories, 2,311,000, though three-fourths of the territorial area is unsuitable for corn growing. Those sections of country in which corn will grow well, practically excluding only the Rocky Mountain region above 5,000 feet elevation, and Alaska, might be placed at 1,500,000 acres. Exclusive of waters, wastes, cities and towns, and necessary forest lands, there would be left about 900,000,000 acres suitable for improvement and cultivation. More than one-fourth of the present improved lands in this area are in corn; if it should be desirable to maintain so large a proportion in the future, which is uncertain, a breadth of 200,000,000 acres might be attained. At the average rate of yield of the past ten years—26.4 bushels—this breadth would represent a product of 5,280,000,000 bushels. Illinois, cultivating a fourth of her farm area in corn, now produces fully one-twentieth of this quantity. When our entire territory becomes as fully occupied as Illinois, a larger rate of yield will be a necessity. Yet the tendency will be, with increase of population, to a diversity in production which will leave to maize a smaller proportion of the cultivated area than it monopolizes at present.

CHANGES IN THE PRODUCTION AND SHIPMENT OF CORN.

Question 8. Please to state your views as to the probable changes in the surplus-producing territory and the modes of shipment of corn.

Answer. The seat of corn production was formerly in the South. Tennessee was, in 1840, the first in rank. In 1849 fifteen Southern States produced 59 per cent. of the national product, ten years later but 52, and now but a third of the crop. Tennessee, in 1849, yielded its position as first in rank to Ohio, and took the fifth, Kentucky, Illinois, and Indiana in their order intervening. In 1850 Tennessee fell another point, Illinois assuming the first place, followed by Ohio, Missouri, Indiana, and Kentucky, the latter exchanging the second place for the fifth and Missouri jumping from the sixth to the third. In 1870 Illinois kept the capital position, though with only half a full crop. Iowa displaced Ohio as second, and Ohio, Missouri, Indiana, Kentucky, and Tennessee following in the same order as in 1860, though each stood one degree lower in rank. In 1877 Illinois and Iowa retained the first and second rank, Missouri and Kansas both jumped Ohio, and then followed, in the same order as in 1870, Indiana, Kentucky, and Tennessee.

Eleven principal States have produced about three-fourths of the whole crop at each of these periods—in 1849 and 1877 77 per cent., 74 per cent. in 1860, and 75 in 1870. Six States appear in each list of eleven, viz, Ohio, Kentucky, Illinois, Indiana, Tennessee, and Missouri; while Virginia, Georgia, Alabama, North Carolina, and Mississippi, in the list of 1849, all fail to appear in that of 1877, their positions in relative rank being taken, respectively, by Kentucky, Tennessee, Texas, Pennsylvania, and Wisconsin. The transference of production from the South to the West is thus shown:

Groups of States.	1849.	Per cent.	1859.	Per cent.	1869.	Per cent.	1877.	Per cent.
	Bushels.		*Bushels.*		*Bushels.*		*Bushels.*	
[illegible]	348,892,271	[illegible]	[illegible]	[illegible]	318,116,583	42	446,410,000	33
All other States and Territories	[illegible]	41	401,892,915	[illegible]	442,827,966	[illegible]	[illegible]	67
	592,071,104		838,792,742		760,944,549		1,342,558,000	

The following are the States that have produced three-fourths of the supply:

States.	1849.		1859.		1869.		1877.	
	Bushels.		*Bushels.*		*Bushels.*		*Bushels.*	
1. Ohio	59,078,695	1. Illinois	115,174,777	1. Illinois	129,921,395	1. Illinois	260,000,000	
2. Ky	58,672,591	2. Ohio	75,543,190	2. Iowa	[illegible]	2. Iowa	156,000,000	
3. Illinois	57,646,984	3. Mo	72,892,157	3. Ohio	67,501,144	3. Mo	103,000,000	
4. Indiana	52,964,303	4. Indiana	71,588,919	4. Mo	[illegible]	4. Kan	[illegible]	
5. Tenn	52,276,223	5. Ky	[illegible]	5. Indiana	51,094,538	5. Ohio	97,000,000	
6. Mo	36,214,537	6. Tenn	52,089,926	6. Ky	[illegible]	6. Indiana	[illegible]	
7. Virginia	35,254,319	7. Iowa	[illegible]	Tenn	41,343,614	7. Ky	59,000,000	
8. Georgia	[illegible]	8. Virginia	[illegible]	8. [illegible]	34,702,006	8. Tenn	[illegible]	
9. Alabama	28,754,048	9. Alabama	33,226,282	9. Virginia	25,847,160	9. Texas	49,000,000	
10. N. C	27,941,051	10. Georgia	30,776,293	10. Texas	20,554,538	10. [illegible]	41,120,000	
11. Miss	22,446,552	11. N. C	30,078,564	11. N. C	18,454,215	11. Wis	[illegible]	
Total	461,329,462		624,144,426		[illegible]		1,049,020,000	
Per cent	[illegible]		74		75		77	

During the whole period the central States of the Mississippi Valley have produced a very large proportion of the crop. The marked changes in locality of production are: 1. A decline in fifteen Southern States from 59 per cent. to 33 per cent. of the crop; 2. An advance from 12 per cent. to 37 per cent. west of the Mississippi River. The movement of the center of production has thus been rapidly northward, and, with still greater rapidity, westward. The Western movement is thus analyzed:

	1849.	1859.	1869.	1877.
Percentage of crop grown on Atlantic coast	[illegible]	24	[illegible]	14
Percentage of crop grown in the central belt	[illegible]	[illegible]	50	49
Percentage of crop grown in the trans-Mississippi belt	12	21	27	37

Amid all these changes, the proportion of the central belt, between the Alleghenies and the Mississippi River, has declined by very slow degrees, and will continue, for a time, to recede slowly, until the lands of the Missouri Valley are more fully occupied. Should cattle husbandry receive the attention in the South which its importance in scientific agriculture demands, after the West becomes crowded with population it is probable that the line of motion of the center of corn production will, at some future time, turn southward again. There is room for wonderful development of corn growing south of the Arkansas, including the Indian Territory, and also, with a recuperative system of culture, in the Southern States east of the Mississippi.

The surplus-producing territory has ever been in the great central basin west of the Alleghenies. Forty years ago the available surplus was produced in the States drained by the Ohio and its tributaries, most largely in Tennessee and Kentucky; ten years later these States held nearly equal rank in production with the three on the north bank of the Ohio. Twenty years ago, in the height of Southern *ante-bellum* prosperity, production between the Ohio and the lakes had surpassed greatly that of the southern portion of the Ohio Valley, and Missouri and Iowa, west of the Mississippi, began the strife for precedence with Kentucky and Tennessee. The movement has since been so strongly westward that nearly four-tenths of the crop of the country is now grown west of the Mississippi. There are now only nine States that produce a surplus: Kentucky and Tennessee about one-fourth more than the average for the country, and the seven States of the corn-growing belt, three east and four west of the Mississippi, more than twice the average product in proportion to population. Of these, Ohio, by virtue of a large population, has a small surplus for other States, leaving Indiana and Illinois on the east side of the Mississippi, and on the west Iowa and Nebraska, Kansas and Missouri to answer almost alone the outside demand for maize. The increase of cattle-feeding in Indiana and Illinois threatens to relegate to the country west of the Mississippi the business of shipping corn in grain. Thus the most bulky form in which this grain can be exported is that in which it is sent the greatest distances to market, in apparent violation of the plainest principle of economy, an anomaly arising not from choice but from the necessities of primitive agriculture, which has few cattle to consume the corn or money to buy the requisite animals for such condensation and conversion. This lack of means for consumption makes the surplus self-competing, till prices are so low as to afford a profit for the middleman over the costs of handling and transportation, whether the distance be 5,000 miles or 10,000. It is a position in which the consumer has no part whatever in fixing the price.

CAPACITY OF THIS COUNTRY FOR THE PRODUCTION OF WHEAT.

Question 9. Please to state your views as to the capacity of the country for extended wheat production.

Answer. While the western line of maize culture traverses the eastern slopes of the Rocky Mountains at an average elevation of about 5,000 feet, wheat can be grown 2,000 to 3,000 feet above the maize line. Thus maize growing is excluded from Wyoming, Montana, Idaho, Washington, and much of California, Arizona, Utah, Colorado, and Dakota. On the contrary, only the higher elevations of the two Sierras, Nevada and Madre, are unsuitable for spring wheat culture by reason of low temperature. The lack of rain and of water available for irrigation constitutes a much stronger inhibition of wheat growing in this region. The territorial area west of the Missouri River, not including the States of Texas, Kansas, or Nebraska, and not counting Alaska, is officially reported as follows:

	Acres.		Acres.
Dakota	96,596,128	Utah	54,065,043
Wyoming	62,645,068	Nevada	71,737,600
Montana	92,016,640	Arizona	72,906,240
Idaho	55,228,160	California	120,947,840
Washington	44,796,160	Oregon	60,975,300
Indian Territory	44,154,240		
Colorado	66,880,000		920,517,059
New Mexico	77,568,640		

A large portion of the Pacific coast is susceptible of culture, either with or without irrigation. The governor of Washington claims for that Territory great superiority in wheat production, and prophecies a yield in the near future three times as large as the present supply of California. The governor of Dakota estimates the area suitable for field culture, and especially suited to wheat-growing, at 40,000,000 acres. These views may prove too sanguine, but there is a good basis for some enthusiasm. The Indian Territory, though only half as large, has nearly as much more available for agricultural production. Montana, better adapted to grazing purposes, is estimated by Prof. Cyrus Thomas, the agricultural topographer of Hayden's survey, to contain 7,800,000 acres of irrigable lands. Counting but one-tenth of the inter-montane region,

which includes two States and six Territories, with four tenths of the area of the Pacific slope on the west, and Dakota and the Indian Territory on the east, we have an aggregate of 200,000,000 acres of land, from the northern and more elevated portions of which the growth of maize is excluded, in which wheat farming will for many years exist as a specialty, dominating all other arable culture, and at many points occupying for a time the cultivated areas almost exclusively. Thus the opportunities for expansion of the present area in wheat in the Free lands of the older States, as yet but partially cultivated, in the wild lands not yet included in farms in the West and South, and in this fertile domain beyond the Missouri, which is six times as large as the present breadth in wheat, surpass any possible requirement of the immediate future, and assure an adequate supply of any deficiency in the world's production for many years to come without starving the rations of our rapidly increasing population.

In this estimate an increase in the rate of yield, as a result of more rational and scientific practice in agriculture, is not considered, as it is probable that the average yield per acre will never be largely increased until the virgin soils have been overrun by the wasteful methods of primitive wheat growing now in vogue here as elsewhere in all countries where land is relatively cheaper than labor.

CHANGES IN THE SURPLUS PRODUCING TERRITORY AND THE MODES OF THE SHIPMENT OF WHEAT.

Question 10. Please to state your views as to the probable changes in the surplus wheat-producing territory and in the modes of shipment.

Answer. The changes of the future will be for some years in the same direction as in the past, a continued movement westward of the center of production. In the area yet to be subdued between the Missouri and the Pacific coast the proportion of the cultivated area devoted to this crop will be larger than in the territory already occupied. When all these available lands are taken up, and population threatens to press upon subsistence, fertilization, with rotation, will increase the rate of yield, as has happened in the most populous districts of Europe, and then the center of wheat production will be likely to recede slowly eastward, obedient to the impulse of improved agriculture in that portion of the country east of the Missouri, which is and ever must be superior for purposes of general agriculture, not only in extent of surface but in variety and due balance of advantages.

The changes of the past are best indicated by dividing the States into convenient groups and presenting the supply of each in bushels to each inhabitant at different periods.

Groups of States.	[illegible]	[illegible]	[illegible]	1877
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*
New England	[illegible]	.34	[illegible]	.39
[illegible]	[illegible]	3.15	3.87	3.38
[illegible]	[illegible]	8.41	6.13	7.58
Southern Atlantic	[illegible]	2.96	1.83	2.84
[illegible]	[illegible]	2.11	1.70	3.27
Ohio Valley	[illegible]	10.79	12.77	10.99
Trans-Mississippi	[illegible]	7.02	11.47	[illegible]
[illegible]	2.16	[illegible]	27.73	27.49

During this period neither New England nor any of the northern groups have been self-supplying. The group comprising New York, New Jersey, and Pennsylvania has had barely a sufficiency only at the beginning of the period, yet it is just to say that the deficiency has ever been occasioned mainly by the growing disproportion between population and wheat production in the State of New York. The group in which Virginia is classed, with Maryland and Delaware, from similarity of crop distribution and named South Middle, has been quite uniformly self-supporting, being naturally a fine winter-wheat region, producing some of the best wheat harvested in the country. In the past few years the tendency to increased production in the South has been greater than at any former period. The only groups producing an appreciable surplus are those of the Ohio Valley, the Missouri Valley, and the Pacific Coast. With a sufficiency for home consumption thirty years ago, the supply of that country beyond the Mississippi is now nearly four times as great, and the growth of this industry on the Pacific Coast has been still more wonderful in its rapidity.

Considering absolute quantity rather than proportion per head, it is seen that the Atlantic States make a small increase in volume, amounting in twenty-eight years to 21 per cent. In the same period the States between the Alleghenies and the Mississippi show an advance of 2.99 per cent., while the trans-Mississippi region, including

all between the river and the ocean, have increased production from 5,306,278 bushels in 1849 to 152,860,000 bushels in 1877. The figures are as follows:

Sections.	1849.	1859.	1869.	1877.
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*
Atlantic coast	51,657,020	53,294,137	57,476,371	64,344,800
Central belt	43,522,646	94,458,609	140,877,070	147,890,000
Trans-Mississippi	5,306,278	25,352,178	89,392,185	152,860,000
	100,485,944	173,104,924	287,745,626	365,094,800

The true rate of progress or decline is best shown by presenting the percentage of each crop grown in the several sections:

Sections.	1849.	1859.	1869.	1877.
Atlantic coast	51.4	30.7	19.9	17.6
Central belt	43.3	54.6	48.9	40.5
Trans-Mississippi	5.3	14.7	31.2	41.9
	100.0	100.0	100.0	100.0

The Atlantic Coast now retains but one-third of its former proportion. The region between the mountains and the great river, increasing its percentage at first, has since sacrificed more than this advance, and the extreme West now produces eight times its former percentage.

The surplus is now produced in five States only in the central belt, lying between the Ohio River and the lakes, and in Minnesota, Iowa, Missouri, Kansas, Nebraska, California, and Oregon. As population increases the surplus will probably diminish in the Ohio Valley, leaving to more western regions the Eastern and European supply. The Southern requirement is small, and with further revival of wheat growing would cease. The State of Nebraska, and Dakota, Washington, and other Territories are looming into prominence in the future wheat supply.

As to changes in the mode of transportation, the most obvious is a marked increase of shipments of flour in place of raw grain. The tendency in all agricultural exportation is towards concentration, reduction of bulk, and increase in value, both for economy of transportation and to secure the profits of manufacture. Flour constitutes less than three-fourths of the weight of the grain (scarcely more than two-thirds under the old modes of milling). The offal is valuable for feeding and fattening farm animals, and the manufacture makes a demand for labor and enlarges the home market for bread. Minnesota now converts a large proportion of her wheat into flour. Saint Louis has increased her manufacture in ten years from 895,154 barrels to 1,916,290. The movements of flour have also greatly increased, as the principal lake and seaport receipts show, as follows:

Ports.	1868.	1878.
	Barrels.	*Barrels.*
Chicago	2,192,413	3,030,562
Milwaukee	567,358	2,263,303
Buffalo	1,502,731	1,919,380
Oswego	1,170	1,894,599
New York	2,855,986	4,675,243
Boston	1,407,681	1,756,557
Philadelphia	759,366	979,380
Baltimore	888,400	1,190,867

This is an increase of 74 per cent. In lake and ocean transportation wheat is preferred to flour, on account of ease in handling by the elevator system, and perhaps from less liability to injury from dampness, so that the proportion of flour exported does not increase. The diversion of freight from canals to railroads obviates in part this disability, and may aid in increasing the proportion of wheat manufactured in the region of its production. The recent improvements in milling increase the economy of manufacture, and the resultant profit stimulates competition for local supplies, causing a division of profits between the millers and the farmers. This is notably the result of mill improvement and competition of millers in Minnesota, and is in accordance with a law of enlightened humanity which dominates our industrial progress.